**RULES**
**OF**
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**
**DIVISION OF RADIOLOGICAL HEALTH**

# CHAPTER 1200-2-8
# RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHY

## TABLE OF CONTENTS



### 1200-2-8-.01 PURPOSE.

This Chapter establishes requirements for the use of sources of radiation for industrial radiography operations. Except for the requirements of this Chapter clearly applicable only to devices employing sealed radioactive sources, e.g., 1200-2-8-.04(1) and (5), both radiation machines and sealed radioactive sources are covered by this Chapter. The provisions of this Chapter are in addition to and not in substitution for other applicable provisions of these regulations.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994.*

### 1200-2-8-.02 SCOPE.

The regulations in this Chapter apply to all licensees or registrants who use sources of radiation for industrial radiography. Nothing in this Chapter shall apply to the use of sources of radiation in the healing arts.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994.*

### 1200-2-8-.03 DEFINITIONS.

(1) 'Annual refresher safety training' means a review conducted or provided by the licensee or registrant for its employees on radiation safety aspects of industrial radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, new or revised regulations, accidents or errors that have been observed, and should also provide opportunities for employees to ask safety questions and receive answers to their safety questions.

(2) 'Associated equipment' means equipment that is used in conjunction with a radiographic exposure device to make radiographic exposures that drives, guides or comes in contact with the source (e.g., guide tube, control tube, control (drive) cable, removable source stop, 'J' tube and collimator) when it is used as an exposure head.

(3) 'Cabinet radiography' means industrial radiography using radiation machines in an enclosed interlocked cabinet in which:

(a) The radiation machine will not operate unless all openings are closed with interlocks activated.

(b) The cabinet is so shielded that every location on the exterior meets the conditions for an unrestricted area as defined in Chapter 1200-2-5, and

(c) The cabinet is so constructed or arranged as to exclude the entrance of any part of the body of an individual during irradiation.

(d) Baggage entrance and exit openings of airport baggage systems need not be interlocked. All other openings in these systems shall be interlocked. The operator shall be present during operation to ensure no individual enters the device through the baggage entrance or exit opening(s).

(4) 'Certifying entity' means an independent certifying organization meeting the requirements in Appendix A to 10 CFR 34 or an Agreement State meeting the requirements in Appendix A to 10 CFR 34 (see Schedule RHS 8-35, Rule 1200-2-8-.16).

(5) 'Collimator' means a radiation shield that is placed on the end of the guide tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.

(6) 'Control (drive) cable' means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

(7) 'Control drive mechanism' means a device that enables the source assembly to be moved to and from the exposure device.

(8) 'Control tube' means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

(9) 'Exposure head' means a device that locates the gamma radiography sealed source in the selected working position. (An exposure head is also known as a 'source stop.')

(10) 'Field station' means a facility where licensed or registered material may be stored or used and from which equipment is dispatched.

(11) 'Guide tube' (or 'projection sheath') means a flexible or rigid tube (i.e., 'J' tube) for guiding the source assembly and the attached control cable from the exposure device to the exposure head. The guide tube may also include the connections necessary for attachment to the exposure device and to the exposure head.

(12) 'Hands-on experience' means experience in all of those areas considered to be directly involved in the radiography process.

(13) 'Independent certifying organization' means an independent organization that meets all of the criteria of appendix A to 10 CFR 34 (see Rule 1200-2-8-.18).

(14) 'Permanent radiographic installation' means an enclosed shielded room, cell or vault, not located at a temporary job-site, in which radiography is performed.

(15) 'Personal supervision' means supervision with the radiographer:

(a) Physically present at the site where sources of radiation and associated equipment are being used.

(b) Observing the radiographer's assistant's performance; and

(c) In such proximity that immediate assistance can be given if required.

(16) 'Practical examination' means a demonstration through practical application of the safety rules and principles in industrial radiography including use of all appropriate equipment and procedures.

(17) 'Radiographer' means any individual who performs or who, in attendance at the site where the radiographic exposure devices are being used, personally supervises industrial radiographic operations and who is responsible to the licensee or registrant for assuring compliance with the requirements of the Division's regulations and the conditions of the license or registration.

(18) 'Radiographer certification' means written approval received from a certifying entity stating that an individual has satisfactorily met certain established radiation safety, testing and experience criteria.

(19) 'Radiographer's assistant' means any individual who under the direct supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in industrial radiography.

(20) 'Radiographic exposure device' (also called a 'camera' or a 'projector') means:

(a) Any instrument having a sealed source in which the sealed source or shielding thereof may be moved or otherwise changed from a shielded to unshielded position for purposes of making a radiographic exposure; or

(b) Any apparatus that may produce, when the associated controls are operated, one or more forms of radiation used for making a radiographic exposure.

(21) 'Radiographic operations' means all activities associated with the presence of sources of radiation in a radiographic exposure device during use of the device or transport (except when being transported by a common or contract transport), to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

(22) 'S-tube' means a tube through which the radioactive source travels when inside a radiographic exposure device.

(23) 'Shielded position' means the location within the radiographic exposure device or source changer where the sealed source is secured and restricted from movement.

(24) 'Shielded room x-ray radiography' means industrial radiography using radiation machines that is conducted in an enclosed room.

(25) 'Source assembly' means an assembly that consists of the sealed source and a connector that attaches the source to the control cable. The source assembly may also include a stop ball used to secure the source in the shielded position.

(Rule 1200-2-8-.03, continued)

(26) 'Source changer' means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those also used for transporting and storage of sealed sources.

(27) 'Storage area' means any location, facility or vehicle which is used to store or to secure a radiographic exposure device, a storage container or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with or unauthorized removal of the device, container or source.

(28) 'Storage container' means a container in which sealed sources are secured and stored.

(29) 'Temporary job site' means a location where industrial radiography is performed and where licensed or registered material may be stored other than the location(s) of use authorized on the specific license or registration.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-101 et seq., 68-202-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Amendment filed June 19, 1989; effective September 27, 1989. Repeal and new rule filed October 27, 1993; effective January 10, 1994. Amendment filed July 18, 2002; effective October 1, 2002. Amendments filed April 10, 2006; effective June 24, 2006.*

**1200-2-8-.04 EQUIPMENT CONTROL.**

(1) Limits on levels of radiation from storage containers and source changers. The maximum exposure rate limits for storage containers and source changers are 200 millirem (2 millisieverts) per hour at any exterior surface and 10 millirem (0.1 millisieverts) per hour at 1-meter from any exterior surface with the sealed source in the shielded position.

(2) Locking of radiographic exposure devices, storage containers and source changers:

(a) Each radiographic exposure device shall have a lock or outer locked container designed to prevent unauthorized or accidental production of radiation or removal of a sealed source from its shielded position. Each radiographic exposure device or storage container shall be kept locked (and if a keyed-lock, with the key removed at all times) when not under the direct surveillance of a radiographer or a radiographer's assistant except at permanent radiographic installations as stated in paragraph 1200-2-8-.06(1). In addition, during radiographic operations a sealed source assembly shall be secured in the shielded position each time the source is returned to that position.

(b) Each sealed source storage container and source changer shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. Storage containers and source changers shall be kept locked (and if a keyed-lock, with the key removed at all times) when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant.

(3) Storage precautions:

(a) Locked radiographic exposure devices, source changers and storage containers shall be physically secured to prevent tampering with or removal by unauthorized persons.

(b) The licensee shall store licensed material in a manner that will minimize danger from explosion or fire.

(4) Radiation survey instruments:

(a) The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments at each location where sources of radiation are present to make physical radiation surveys as required by this chapter and Chapter 1200-2-5 of these regulations. Instrumentation required by this paragraph shall have a range such that 2 millirems (0.02 millisieverts) per hour through 1 rem (0.01 sievert) per hour can be measured.

(b) Each radiation survey instrument shall be calibrated:

1. At energies appropriate for use and at intervals not to exceed six (6) months and after each instrument servicing, except for battery changes.

2. Such that accuracy within plus or minus twenty percent (±20%) can be demonstrated; and

3. For linear scale instruments, at 2 points located approximately one-third and two-thirds of full scale on each scale; for logarithmic scale instruments, at mid-range of each decade and at 2 points of at least one decade; and for digital instruments, at 3 points between 2 and 1,000 millirems (0.02 and 10 millisieverts) per hour.

(c) In accordance with Rule 1200-2-8-.15, the licensee or registrant shall maintain records of calibrations, dates and results thereof for inspection by the Division for three (3) years after the date of calibration.

(5) Leak testing, repairing, tagging, opening, modifying and replacing of sealed sources:

(a) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening or any other modification of any sealed source shall be performed only by persons specifically authorized to do so by the Division, the U.S. Nuclear Regulatory Commission, or any Agreement State.

(b) Each sealed source shall be tested for leakage at intervals not to exceed six (6) months. In the absence of a certificate from a transferor that a test has been made within the six (6) months prior to the transfer, the sealed source shall not be put into use until tested.

(c) The leak test shall be capable of detecting the presence of 0.005 microcurie of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed source storage position, or other appropriate measuring point, by a procedure to be approved pursuant to 1200-2-10-.13(6)(e). Records of leak test results shall identify each sealed source and its container by serial number and shall be kept in units of microcuries or disintegrations per minute (dpm) and maintained for inspection by the Division for three years after the test is made.

(d) Any test conducted pursuant to (b) and (c) of this paragraph that reveals the presence of 0.005 microcurie or more of removable radioactive material shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause it to be decontaminated and repaired or to be disposed of in accordance with Division regulations. Two copies of a report shall be filed within five (5) days after obtaining results of the test with the Division at its office located at L&C Annex, 3rd Floor, 401 Church

Street, Nashville, Tennessee 37243-1532, describing the equipment involved, the test results and the corrective action taken.

(e) A sealed source that is not fastened to or contained in a radiographic exposure device shall have permanently attached to it a durable tag at least one (1) inch (2.54 centimeters) square bearing the conventional radiation caution symbol, as described in Chapter 1200-2-5, and at least the instructions:

"DANGER - RADIOACTIVE MATERIAL - DO NOT HANDLE - NOTIFY CIVIL AUTHORITIES IF FOUND"

(f) Each exposure device using depleted uranium (DU) shielding and an 'S' tube configuration shall be tested for DU contamination at intervals not to exceed 12 months. The analysis shall be capable of detecting the presence of 185 Bq (0.005 microcuries) of radioactive material on the test sample and shall be performed by a person specifically authorized by the Division, the U.S. NRC or an Agreement State to perform the analysis.

1. Should such testing reveal the presence of 185 Bq (0.005 microcuries) or more of removable DU contamination, the exposure device shall be removed from use until an evaluation of the wear on the S-tube has been made. Should the evaluation reveal that the S-tube is worn through, the device may not be used again.

2. DU shielded devices do not have to be tested for DU contamination while in storage and not in use. Before using or transferring such a device however, the device shall be tested for DU contamination if the interval of storage exceeded 12 months.

(6) Quarterly inventory. Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation received and possessed by him. The records of the inventories shall be maintained for three (3) years from the date of the inventory for inspection by the Division. The records shall include the quantities and kinds of radioactive material, location of all sources of radiation, and the date of inventory. Each sealed source and each radiographic exposure device shall be identified by serial number.

(7) Utilization logs.

(a) Each licensee or registrant shall maintain, at the address specified in the license or registration, current utilization logs showing for each source of radiation the following information:

1. A description (make, model and serial number) of each radiographic exposure device or transport or storage container in which the sealed source is located;

2. The identity and signature of the radiographer to whom assigned; and

3. The plant or site where used and dates of use, including the dates removed and returned to storage.

(b) In accordance with Rule 1200-2-8-.04(7), the licensee shall retain the logs required by subparagraph (a) for inspection by the Division for three (3) years after the log is made.

(c) Locations (plant or site) where used and dates of use.

(8) Inspection and maintenance of radiographic exposure devices, source changers, transport and storage containers, associated equipment and survey instruments.

(a) The licensee shall perform visual and operability checks on survey meters, radiographic exposure devices, transport and storage containers, associated equipment and source changers prior to use each day the equipment is used to ensure that the equipment is in good working condition, that the sources are adequately shielded and that required labeling is present. Survey instrument operability shall be performed using check sources or other appropriate means. If equipment problems are found, the equipment shall be removed from service until repaired.

(b) The licensee shall have written procedures for:

1. Inspection and routine maintenance of radiographic exposure devices, source changers, associated equipment, transport and storage containers at intervals not to exceed three (3) months, or before the first use thereafter, to assure proper functioning of components important to safety. If equipment problems are found, the equipment shall be removed from service until repaired.

2. Inspection and maintenance necessary to maintain the Type B packaging used to transport radioactive materials. The inspection and maintenance program shall include procedures to assure that Type B packages are shipped and maintained in accordance with the certificate of compliance or other approval.

(9) Permanent radiographic installations.

(a) Permanent radiographic installations having high radiation area entrance controls of the types described in Chapter 1200-2-5 shall also meet the special requirements in (b) and (c) of this paragraph.

(b) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation shall have both visible and audible warning signals to warn of the presence of radiation. The visible signal shall be actuated by radiation whenever the source is exposed or a radiation area is generated. The audible signal shall be actuated when an attempt is made to enter the installation while the source is exposed or a radiation area is generated.

(c) The alarm system shall be tested for proper operation with a radiation source each day before the installation is used for radiographic operations. The test shall include a check of both the visible and audible signals. Entrance control devices that reduce the radiation level upon entry shall be tested monthly. If an entrance control device or an alarm is operating improperly, it shall be immediately labeled as defective and repaired within seven (7) calendar days. The facility may continue to be used during this seven-day period, provided the licensee implements the continuous surveillance requirements of paragraph 1200-2-8-.06(1) and uses an alarming ratemeter. The licensee or registrant shall retain records of these tests for three (3) years for inspection by the Division.

(10) Performance requirements for sealed source radiographic exposure devices and associated equipment. Equipment utilizing radioactive material used in industrial radiographic operations shall meet the following minimum criteria:

(a) Each radiographic exposure device and all associated equipment shall meet the requirements specified in American National Standard N432-1980 “Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography,” (published as NBS Handbook 136, issued January 1981) American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018 (ANSI N432). An applicant or licensee may submit engineering analyses to demonstrate the applicability of previously performed testing on similar individual radiography equipment

components. Upon review, the Division may find this an acceptable alternative to actual testing of the component under the above referenced standard.

(b) In addition to the requirements specified above in subparagraph (a), the following requirements apply to radiographic exposure devices, source changers, source assemblies and sealed sources.

1. The licensee shall ensure that each radiographic exposure device has attached to it a durable, legible, clearly visible label bearing the:

(i) Chemical symbol and mass number of the radionuclide in the device;

(ii) Activity and the date on which this activity was last measured;

(iii) Model (or product code) and serial number of the sealed source;

(iv) Manufacturer's identity of the sealed source; and

(v) Licensee's name, address and telephone number.

2. Radiographic exposure devices intended for use as Type B transport containers shall meet the applicable requirements of 10 CFR part 71.

3. Modification of radiographic exposure devices, source changers, and source assemblies and associated equipment is prohibited, unless the design of any replacement component, including source holder, source assembly, controls or guide tubes would not compromise the design safety features of the system.

(c) In addition to the requirements specified above in subparagraphs (a) and (b), the following requirements apply to radiographic exposure devices, source assemblies and associated equipment that allow the source to be moved out of the device for radiographic operations or to source changers.

1. The coupling between the source assembly and the control cable shall be designed in such a manner that the source assembly will not become disconnected if cranked outside the guide tube. The coupling shall be such that it cannot be unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.

2. The device shall automatically secure the source assembly when it is cranked back into the fully shielded position within the device. This securing system may only be released by means of a deliberate operation on the exposure device.

3. The outlet fittings, lock box and drive cable fittings on each radiographic exposure device shall be equipped with safety plugs or covers, which shall be installed during storage and transportation to protect the source assembly from water, mud, sand or other foreign matter.

4. (i) Each sealed source or source assembly shall have attached to it or engraved on it, a durable, legible, visible label with the words:

**"CAUTION (or "DANGER")-RADIOACTIVE.''**

(ii) The label may not interfere with the safe operation of the exposure device or associated equipment.

5. The guide tube shall be able to withstand a crushing test that closely approximates the crushing forces that are likely to be encountered during use, and be able to withstand a kinking resistance test that closely approximates the kinking forces that are likely to be encountered during use.

6. Guide tubes shall be used when moving the source out of the device.

7. An exposure head or similar device designed to prevent the source assembly from passing out of the end of the guide tube shall be attached to the outermost end of the guide tube during industrial radiography operations.

8. The guide tube exposure head connection shall be able to withstand the tensile test for control units specified in ANSI N432-1980.

9. Source changers shall provide a system for ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.

(d) All newly manufactured radiographic exposure devices and associated equipment acquired by licensees after January 10, 1992, shall comply with the requirements of this paragraph.

(e) All radiographic exposure devices and associated equipment in use after January 10, 1996, shall comply with the requirements of this paragraph.

(f) Notwithstanding subparagraph (1)(a) above, equipment used in industrial radiographic operations need not comply with §8.9.2(c) of the Endurance Test in American National Standards Institute N432-1980, if the prototype equipment has been tested using a torque value representative of the torque that an individual using the radiography equipment can realistically exert on the lever or crankshaft of the drive mechanism.

(11) Labeling, storage and transportation.

(a) The licensee may not use a source changer or a container to store licensed material unless the source changer or the storage container has securely attached to it a durable, legible and clearly visible label bearing the standard trefoil radiation caution symbol in conventional colors, i.e., magenta, purple or black on a yellow background, having a minimum diameter of 25 mm, and the wording:

**CAUTION (or "DANGER")**
**RADIOACTIVE MATERIAL**
**NOTIFY CIVIL AUTHORITIES (or "NAME OF COMPANY")**

(b) The licensee shall not transport licensed material unless the material is packaged and the package is labeled, marked and accompanied with appropriate shipping papers in accordance with regulations set out in 10 CFR part 71.

(c) Locked radiographic exposure devices and storage containers shall be physically secured to prevent tampering or removal by unauthorized personnel. The licensee shall store licensed material in a manner that will minimize danger from explosion or fire.

(Rule 1200-2-8-.04, continued)

(d) The licensee shall lock and physically secure the transport package containing licensed material in the transporting vehicle to prevent accidental loss, tampering or unauthorized removal of the licensed material from the vehicle.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-101 et seq., 68-202-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994. Amendment filed July 18, 2002; effective October 1, 2002. Amendments filed April 10, 2006; effective June 24, 2006.*

**1200-2-8-.05 PERSONAL RADIATION SAFETY REQUIREMENTS FOR RADIOGRAPHERS AND RADIOGRAPHER'S ASSISTANTS.**

(1) Training.

(a) The licensee or registrant shall not permit any individual to act as a radiographer as defined in this Chapter until such individual:

1. Has been instructed in the subjects outlined in 1200-2-8-.07 and has demonstrated understanding thereof by successful completion of a written test and a field examination on the subjects covered that has been approved by the Division;

2. Has received copies of and instruction in:

(i) The regulations contained in this Chapter;

(ii) The applicable rules of Chapters 1200-2-5 and 1200-2-8;

(iii) License or registration conditions; and

(iv) The licensee's or registrant's operating and emergency procedures and shall have been tested in a manner approved by the Division to demonstrate understanding thereof; and

3. Has physically demonstrated competence to use the sources of radiation, related handling tools, and survey instruments that will be employed in his assignment.

(b) The licensee or registrant shall not permit any individual to act as a radiographer's assistant as defined in this Chapter until such individual:

1. Has received copies of and instruction in the licensee's or registrant's operating and emergency procedures and shall have been tested in a manner approved by the Division to demonstrate understanding thereof; and

2. Has physically demonstrated competence to use, under the personal supervision of the radiographer, the sources of radiation, related handling tools, and survey instruments that will be employed in his assignment.

(c) Each licensee or registrant shall maintain the following records of training and certification for three (3) years after the record is made for inspection by the Division.

1. Records of training of each radiographer and each radiographer's assistant. The record shall include radiographer certification documents and verification of certification status,

copies of written tests, dates of oral and practical examinations, and names of individuals conducting and receiving the oral and practical examinations; and

2. Records of annual refresher safety training and semi-annual inspections of job performance for each radiographer and each radiographer's assistant. The records shall list the topics discussed during the refresher safety training, the dates the annual refresher safety training was conducted, and names of the instructors and attendees. For inspections of job performance, the records shall also include a list showing the items checked and any non-compliance(s) observed by the radiological safety officer.

(d) Whenever a radiographer's assistant uses sources of radiation or related handling tools or conducts radiation surveys required by 1200-2-8-.06(3)(b) to determine that the sealed source has returned to the shielded position after an exposure, he shall be under the personal supervision of a radiographer.

(2) Operating and emergency procedures. The licensee or registrant shall submit to the Division a copy of current operating and emergency procedures prior to the issuance or renewal of a license or registration. The licensee or registrant shall retain a copy of the operating and emergency procedures until the Division terminates the license or registration that authorizes the activity for which the procedures were developed. If the operating and emergency procedures are superseded, the superseded procedures shall be retained by the licensee or registrant for three (3) years after each change. These procedures shall include specific instructions in at least the following:

(a) The handling and use of sources of radiation to be employed such that no individual shall be exposed to radiation doses in excess of the limits established in Chapter 1200-2-5 of these regulations;

(b) Methods and occasions for conducting radiation surveys;

(c) Methods for controlling access to radiographic areas;

(d) Methods and occasions for locking and securing sources of radiation;

(e) Personnel monitoring and the use of personnel monitoring equipment;

(f) Transportation to field locations, including packing of sources of radiation in the vehicles, posting of vehicles and control of sources of radiation during transportation;

(g) Minimizing exposure of individuals in the event of an accident;

(h) The procedure for notifying proper persons in the event of an accident;

(i) Maintenance of records;

(j) The inspection and maintenance of radiographic exposure devices and storage containers; and

(k) Steps that shall be taken immediately by radiographic personnel in the event a pocket dosimeter is found to be off-scale.

(3) Personnel monitoring.

(a) The licensee may not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic operations, each individual wears, on the trunk of the

body, a direct reading dosimeter, an operating alarm ratemeter, and a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor. At permanent radiography installations where other appropriate alarming or warning devices are in routine use, the wearing of an alarming ratemeter is not required.

1. Pocket dosimeters shall have a range from zero to 2 millisieverts (200 millirems) and shall be recharged at the start of each shift. Electronic personal dosimeters may only be used in place of ion-chamber pocket dosimeters.

2. Each personnel dosimeter shall be assigned to and worn only by one individual.

3. Film badges shall be replaced at periods not to exceed one month and other personnel dosimeters processed and evaluated by an accredited NVLAP processor shall be replaced at periods not to exceed three months.

4. After replacement, each personnel dosimeter shall be processed as soon as possible.

(b) Direct reading dosimeters such as pocket dosimeters or electronic personal dosimeters shall be read and the exposures recorded at the beginning and end of each shift. In accordance with Rule 1200-2-8-.15, the licensee or registrant shall maintain each record of these exposures for inspection by the Division for three (3) years after the record is made.

(c) Pocket dosimeters, or electronic personal dosimeters, shall be checked at periods not to exceed 12 months for correct response to radiation. Acceptable dosimeters shall read within plus or minus 20 percent (±20%) of the true radiation exposure. In accordance with Rule 1200-2-8-.15, the licensee or registrant shall maintain each record of these exposures for inspection by the Division for three (3) years after the record is made.

(d) If an individual's pocket chamber is found to be off-scale, or if his or her electronic personal dosimeter reads greater than 2 millisieverts (200 millirems), and the possibility of radiation exposure cannot be ruled out as the cause, the individual's personnel dosimeter shall be sent for processing within 24 hours. In addition, the individual may not resume work associated with licensed material use until a determination of the individual's radiation exposure has been made. This determination shall be made by the RSO or the RSO's designee. The results of this determination shall be included in the records maintained in accordance with Rule 1200-2-8-.15.

(e) If the personnel dosimeter that is required by paragraph (a) of this section is lost or damaged, the worker shall cease work immediately until a replacement personnel dosimeter meeting the requirements in paragraph (a) is provided and the exposure is calculated for the time period from issuance to loss or damage of the personnel dosimeter. The results of the calculated exposure and the period for which the personnel dosimeter was lost or damaged shall be included in the records maintained in accordance with Rule 1200-2-8-.15.

(f) Dosimetry reports received from the accredited NVLAP personnel dosimeter processor shall be retained for inspection by the Division in accordance with Rule 1200-2-8-.15.

(g) Each alarm ratemeter shall:

1. Be checked to ensure that the alarm functions properly (sounds) before using at the start of each shift;

(Rule 1200-2-8-.05, continued)

2. Be set to give an alarm signal at a preset dose rate of 5 mSv/hr (500 mrem/hr); with an accuracy of plus or minus 20 percent of the true radiation dose rate;

3. Require special means to change the preset alarm function; and

4. Be calibrated at periods not to exceed 12 months for correct response to radiation. The licensee shall maintain records of alarm ratemeter calibrations in accordance with Rule 1200-2-8-.15.

(4) Conducting industrial radiographic operations.

(a) Whenever radiography is performed at a location other than a permanent radiographic installation, at least one other qualified radiographer or an individual who has at a minimum met the requirements of paragraph 1200--2-8-.07(3) shall accompany the radiographer. The additional qualified individual shall observe the operations and be capable of providing immediate assistance to prevent unauthorized entry. Radiography shall not be performed if only one qualified individual is present.

(b) Reserved.

(5) Radiation safety officer (RSO) for industrial radiography. The RSO shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's or registrant's program.

(a) The minimum qualifications, training and experience for RSOs for industrial radiography are as follows:

1. Completion of the training and testing requirements of 1200–2–8–.07(1);

2. 2000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and

3. Formal training in the establishment and maintenance of a radiation protection program.

(6) Supervision of radiographers' assistants. Whenever a radiographer's assistant uses radiographic exposure devices, associated equipment or sealed sources or conducts radiation surveys required by subparagraph 1200-2-8-.06(3)(b) to determine that the sealed source has returned to the shielded position after an exposure, the assistant shall be under the personal supervision of a radiographer. The personal supervision shall include:

(a) The radiographer's physical presence at the site where the sealed sources are being used;

(b) The availability of the radiographer to give immediate assistance if required; and

(c) The radiographer's direct observation of the assistant's performance of the operations referred to in this section.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-101 et seq., 68-202-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994. Amendment filed July18, 2002; effective October 1, 2002. Amendment filed November 17, 2005; effective January 31, 2006. Amendments filed April 10, 2006; effective June 24, 2006.*

**1200-2-8-.06 PRECAUTIONARY PROCEDURES IN RADIOGRAPHIC OPERATIONS.**

(1) Security. During each radiographic operation the radiographer, or the other individual present, as required by subparagraph 1200-2-8-.05(4)(a), shall maintain continuous, direct, visual surveillance of the operation to protect against unauthorized entry into a high radiation area as defined in Chapter 1200-2-5 except at permanent radiographic installations where all entryways are locked and the requirements of paragraph 1200-2-8-.04(9) are met.

(2) Posting. Areas in which radiography is being performed shall be conspicuously posted according to the standards set out in Chapter 1200-2-5, without exceptions.

(3) Radiation surveys and survey records.

(a) The licensee or registrant shall ensure that at least one calibrated and operable radiation survey instrument is available:

1. At the location of its radiographic operations; and

2. At the storage area, as defined in 1200-2-8-.03, whenever a radiographic exposure device, a storage container or source is being placed in storage.

(b) After each exposure, the licensee or registrant shall ensure that a survey with a calibrated and operable radiation survey instrument is made to determine that the sealed source has been returned to its shielded position or that the radiation from the radiation machine has been terminated. The entire circumference of the radiographic exposure device shall be surveyed. If the radiographic exposure device has a source guide tube, the survey shall include the guide tube. The survey shall determine that the sealed source has returned to its shielded position before exchanging films, repositioning the exposure head or dismantling equipment.

(c) Any time the source is exchanged and whenever a radiographic exposure device is placed in a storage area, the licensee shall ensure that a survey with a calibrated and operable radiation survey instrument is made to determine that the sealed source is in its shielded position. The entire circumference of the radiographic exposure device shall be surveyed. The results of the last storage survey of the workday, required by this subparagraph (c), shall be recorded and retained for three (3) years.

(d) Records shall be kept of the duration of each radiographic exposure and the number of exposures made. In addition, for each radiographic exposure employing a radiation machine the voltage and current used shall be noted. These records shall be maintained for three (3) years for inspection by the Division and for field work may be kept on the area survey form.

(e) Each licensee or registrant conducting industrial radiography at a temporary job-site shall have the following documents available at that site for inspection by the Division:

1. Appropriate license or registration;

2. Operating and emergency procedures;

3. Applicable regulations;

4. Survey records required pursuant to 1200-2-8-.06 and Chapter 1200-2-5 for the period of operation at the site;

5. Daily pocket dosimeter records for the period of operation at the site; and

6. The latest instrument calibration and leak test records for specific devices in use at the site. Acceptable records include tags or labels that are affixed to the device or survey meter.

(4) Radiation surveys.

(a) Conduct surveys with a calibrated and operable radiation survey instrument that meets the requirements of Rule 1200-2-8-.04(4).

(b) Using a survey instrument meeting the requirements of subparagraph (a), conduct a survey of the radiographic exposure device and the guide tube after each exposure when approaching the device or the guide tube. The survey shall determine that the sealed source has returned to its shielded position before exchanging films, repositioning the exposure head, or dismantling equipment.

(c) Conduct a survey of the radiographic exposure device with a calibrated radiation survey instrument any time the source is exchanged and whenever a radiographic exposure device is placed in a storage area (as defined in paragraph 1200-2-8-.03(27), to ensure that the sealed source is in its shielded position.

(d) Maintain records in accordance with Rule 1200-2-8-.15.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-101 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Amendment filed June 19, 1989; effective September 27, 1989. Repeal and new rule filed October 27, 1993; effective January 10, 1994. Amendment filed July 18, 2002; effective October 1, 2002.*

**1200-2-8-.07 MINIMUM SUBJECTS TO BE COVERED IN TRAINING RADIOGRAPHERS.**

(1) A licensee may not permit any individual to act as a radiographer until the individual:

(a) Has received training in the subjects below in paragraph (7), in addition to a minimum of two (2) months of on-the-job training, and is certified through a radiographer certification program by a certifying entity in accordance with the criteria specified in Appendix A to 10 CFR 34 (see Schedule RHS 8-35, Rule 1200-2-8-.16). (An independent organization that would like to be recognized as a certifying entity shall submit its request to the Director, Office of Nuclear Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC. 20555-0001.) or

(2) In addition, the licensee may not permit any individual to act as a radiographer until the individual:

(a) Has received copies of and instruction in the requirements in this chapter; in applicable rules of Chapters 1200-2-5 and 1200-2-10, in applicable U.S. DOT regulations as referenced in 10 CFR part 71, license or registration conditions and the licensee's or registrant's operating and emergency procedures;

(b) Has demonstrated understanding of the licensee's license and operating and emergency procedures by successful completion of a written or oral examination covering this material.

(c) Has received training in the use of the licensee's radiographic exposure devices, sealed sources, in the daily inspection of devices and associated equipment and in the use of radiation survey instruments.

(d) Has demonstrated understanding of the use of radiographic exposure devices, sources, survey instruments and associated equipment described above in subparagraphs (2)(a) and (2)(c) by successful completion of a practical examination covering this material.

(3) The licensee may not permit any individual to act as a radiographer's assistant until the individual:

(a) Has received copies of and instruction in the requirements in this chapter, in applicable rules of Chapters 1200-2-5 and 1200-2-10, in applicable U.S. DOT regulations as referenced in 10 CFR part 71, license or registration conditions and the licensee's or registrant's operating and emergency procedures;

(b) Has developed competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, associated equipment and radiation survey instruments that the assistant will use; and

(c) Has demonstrated understanding of the instructions provided above in subparagraph (3)(a) by successfully completing a written test on the subjects covered and has demonstrated competence in the use of hardware described above in subparagraph (3)(b) by successful completion of a practical examination on the use of such hardware.

(4) The licensee shall provide annual refresher safety training for each radiographer and radiographer's assistant at intervals not to exceed 12 months.

(5) Except as provided below in subparagraph (5)(d), the radiological safety officer or designee shall conduct an inspection program of the job performance of each radiographer and radiographer's assistant to ensure that the Division's regulations, license requirements and the applicant's operating and emergency procedures are followed. The inspection program shall:

(a) Include observation of the performance of each radiographer and radiographer's assistant during an actual industrial radiographic operation, at intervals not to exceed six (6) months; and

(b) Provide that, if a radiographer or a radiographer's assistant has not participated in an industrial radiographic operation for more than six (6) months since the last inspection, the radiographer shall demonstrate knowledge of the training requirements of subparagraph 1200-2-8-.07(2)(c) and the radiographer's assistant shall re-demonstrate knowledge of the training requirements of subparagraph 1200-2-8-.07(3)(b) by a practical examination before these individuals can next participate in a radiographic operation.

(c) The Division may consider alternatives in those situations where the individual serves as both radiographer and radiological safety officer.

(d) In those operations where a single individual serves as both radiographer and radiological safety officer and performs all radiography operations, an inspection program is not required.

(6) The licensee shall maintain records of the above training to include certification documents, written and practical examinations, refresher safety training and inspections of job performance in accordance with paragraph 1200-2-8-.05(1)(c).

(Rule 1200-2-8-.07, continued)

(7) The licensee shall include the following subjects required above in paragraph (1):

(a) Fundamentals of radiation safety including:

1. Characteristics of gamma radiation;

2. Units of radiation dose and quantity of radioactivity;

3. Hazards of exposure to radiation;

4. Levels of radiation from licensed material; and

5. Methods of controlling radiation dose (time, distance and shielding);

(b) Radiation detection instruments including:

1. Use, operation, calibration and limitations of radiation survey instruments;

2. Survey techniques; and

3. Use of personnel monitoring equipment;

(c) Equipment to be used including:

1. Operation and control of radiographic exposure equipment, remote handling equipment and storage containers, including pictures or models of source assemblies (pigtails).

2. Storage, control and disposal of licensed material; and

3. Inspection and maintenance of equipment.

(d) The requirements of pertinent Federal regulations; and

(e) Case histories of accidents in radiography.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-201 et seq., and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994. Amendment filed July 18, 2002; effective October 1, 2002. Amendment filed November 17, 2005; effective January 31, 2006.*

**1200-2-8-.08 CABINET RADIOGRAPHY.**

(1) The only requirement of this Chapter which applies to cabinet radiography as defined in this Chapter is that no registrant shall permit any individual to operate a cabinet radiography unit until such individual has:

(a) Received a copy of the operating procedures for the unit;

(b) Received instruction in the operating procedures;

(c) Demonstrated an understanding of the operating procedures; and

(Rule 1200-2-8-.08, continued)

(d) Demonstrated competence in the use of the unit.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994.*

**1200-2-8-.09 FLUOROSCOPIC RADIOGRAPHY.**

Radiography utilizing fluoroscopy should be done only by remote observation; however, if direct viewing of the screen by personnel is used, the registrant shall demonstrate that radiation exposure limits are not exceeded.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994.*

**1200-2-8-.10 REQUIRED ADMINISTRATIVE PROCEDURES FOR INDUSTRIAL RADIOGRAPHY PROGRAM.**

(1) Licensees and registrants shall have a program for training radiographers and radiographer's assistants and submit to the Division for approval a schedule or description of such program that includes the:

(a) Initial training:

1. This initial training shall consist of a complete training program as outlined in 1200-2-8-.07 or

2. Resumes of prior training and experience of individuals that show fulfillment of the requirements of 1200-2-8-.07(7)(a) and (b) and the initial training of such individuals in the licensee's or registrant's specific radiography program as outlined in 1200-2-8-.07(7)(c), (d) and (e);

(b) Periodic training (shall be at least annual);

(c) On-the-job training;

(d) Means to be used by the licensee or registrant to determine the radiographer's knowledge and understanding of and ability to comply with:

1. Division regulations and licensing or registration requirements; and

2. The licensee's or registrant's operating and emergency procedures; and

(e) Means to be used by the licensee or registrant to determine the radiographer's assistant's knowledge and understanding of and ability to comply with the licensee's or registrant's operating and emergency procedures;

(2) The licensee or registrant shall establish and submit to the Division for approval written operating and emergency procedures as described in 1200-2-8-.05(2);

(3) The licensee or registrant shall establish and submit to the Division a description of its inspection program adequate to ensure that its radiographers and radiographer's assistants follow the Division's regulatory requirements and the licensee's or registrant's operating and emergency procedures. The inspection program shall:

(a) Include observation of the performance of each radiographer and radiographer's assistant during an actual radiographic operation at intervals not to exceed six (6) months;

(b) Provide that if a radiographer or a radiographer's assistant has not participated in a radiographic operation for more than six (6) months since the last inspection, that individual's performance shall be observed and recorded the next time the individual participates in a radiographic operation; and

(c) Include the retention of inspection records on the performance of radiographers or radiographer's assistants for three (3) years;

(4) The licensee or registrant shall submit to the Division a description of his overall organizational structure pertaining to the radiography program, including specified delegations of authority and responsibility for operation of the program; and

(5) The licensee who desires to conduct his own leak tests shall establish procedures to be followed in testing sealed sources for possible leakage and/or contamination and shall submit to the Division for approval a description of such procedures including:

(a) Instrumentation to be used;

(b) Method of performing tests, e.g., points on equipment to be smeared and method of taking the smear; and

(c) Pertinent experience of the person who will perform the test.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Amendment filed June 19, 1989; effective September 27, 1989. Repeal and new rule filed October 27, 1993; effective January 10, 1994. Amendments filed November 17, 2005; effective January 31, 2006.*

**1200-2-8-.11 SHIELDED ROOM X-RAY RADIOGRAPHY.**

(1) The only requirements of this Chapter applying to shielded room x-ray radiography are as follows:

(a) All entrances into the shielded room shall be provided with interlocks. After an interlock has been interrupted, broken, or tripped, it shall be possible to cause x-rays to be produced again only from the control panel. Interlocks shall not be used to shut off the x-ray equipment except in an emergency or during testing.

(b) Emergency shut-off switches shall be located within the high radiation areas so as to be accessible to individuals therein within the warning period in paragraph (5). These switches and their mode of operation shall be identified by a conspicuously posted sign adjacent to the switch. The emergency shut-off switches shall include a manual reset that must be reset at the switch before x-rays can again be produced from the control panel. After an emergency shut-off switch has been activated, it shall be possible to produce x-rays again only from the control panel.

(c) The interlock system and the emergency shut-off system shall be separate electrical and/or mechanical systems.

(Rule 1200-2-8-.11, continued)

(d) The interior of the shielded room shall be provided with flashing or rotating warning lights that operate when, and only when, radiation is being produced. These lights shall be so positioned that they can be observed from any position or orientation within the room.

(e) An audible warning signal within the room shall be actuated for at least ten (10) seconds immediately prior to the first initiation of radiation after the closing of any opening that can admit personnel.

(f) The x-ray equipment control panel shall be provided with a locking device to prevent unauthorized use. Such locking device shall, when locked, prevent the production of x-ray radiation by the equipment.

(g) All entrances into the shielded room shall be provided with a conspicuously visible warning device, which need not be flashing or rotating but which operates only when radiation is being produced.

(h) Surveys shall be made as required in 1200-2-8-.06(3)(b). Personnel devices providing an audible signal when activated by radiation will be acceptable for this survey. Proper operation of this device shall be checked daily and a record maintained of this check. All personnel working with the x-ray equipment shall be provided with such a device. This device shall be designed so as to clearly indicate entry into a 2 milliroentgen per hour x-ray radiation field.

(i) All personnel associated with the x-ray equipment shall be provided with personnel monitoring devices that shall be calibrated for the x-ray energies being utilized. Records of personnel exposure shall be maintained as required in Chapter 1200-2-5.

(j) No registrant shall permit any individual to operate a radiation machine for shielded room x-ray radiography until such individual has received a copy of, instruction in, and demonstrated an understanding of operating and emergency procedures for the unit, and competence in its use. (See 1200-2-8-.05(2)(a), (c), (d), (e), (g), (h), (i), (j) and (k)). These operating and emergency procedures shall be submitted to the Division for approval prior to their adoption.

(k) All safety and warning devices, including interlocks and emergency shut-off switches, shall be tested at intervals not to exceed three (3) months to determine that they are functioning properly. Records shall be maintained of all tests.

(l) If a safety or warning device malfunctions, the x-ray control panel shall be locked in the "off" position. It shall not be used, except as may be necessary for repair or replacement of the malfunctioning safety or warning device, until the safety or warning device is functioning properly.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule certified June 7, 1974. Amendment filed August 15, 1978; effective October 2, 1978. Amendment filed April 3, 1986; effective May 31, 1986. Repeal and new rule filed October 27, 1993; effective January 10, 1994.*

**1200-2-8-.12 REPORTING REQUIREMENTS.**

(1) In addition to the reporting requirements specified in other chapters of these regulations, each licensee or registrant shall provide a written report to the Division at the address in Rule 1200–2–4–.07, within 30 days of the occurrence of any of the following incidents involving radiographic equipment::

(a) Unintentional disconnection of the source assembly from the control cable.

(Rule 1200-2-8-.12, continued)

(b) Inability to retract the source assembly to its fully shielded position and secure it in this position.

(c) Failure of any component (critical to safe operation of the device) to properly perform its intended function.

(2) The licensee or registrant shall include the following information in each report submitted under (1) of this Rule:

(a) A description of the equipment problem.

(b) Cause of each incident, if known.

(c) Manufacturer and model number of equipment involved in the incident.

(d) Place, time and date of the incident.

(e) Actions taken to establish normal operations.

(f) Corrective actions taken or planned to prevent recurrence.

(g) Qualifications of personnel involved in the incident.

(3) Reports of overexposure submitted under Chapter 1200-2-5 that involve failure of safety components of radiographic exposure devices or associated equipment shall also include the information specified in (2) of this Rule.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-201 et seq., 68-202-203 and 68-202-206.* ***Administrative History:*** *Original rule filed October 27, 1993; effective January 10, 1994. Amendment filed November 17, 2005; effective January 31, 2006. Amendment filed April 10, 2006; effective June 24, 2006.*

**1200-2-8-.13 RESERVED.**

**1200-2-8-.14 RESERVED.**

**1200-2-8-.15 RECORDKEEPING REQUIREMENTS.**

(1) Location of documents and records.

(a) Each licensee and registrant shall maintain copies of records required by this rule and other applicable parts of this chapter at the location specified in the license or registration.

(b) Each licensee and registrant shall also maintain copies of the following documents and records sufficient to demonstrate compliance at each applicable field station and each temporary jobsite;

1. The license or registration authorizing the use of licensed material or registered equipment;

2. A copy of “State Regulations for Protection Against Radiation;”

3. Utilization records for each radiographic exposure device dispatched from that location as required by paragraph 1200-2-8-.04(7).

(Rule 1200-2-8-.15, continued)

4. Records of equipment problems identified in daily checks of equipment as required by paragraph 1200-2-8-.04(8). The licensee or registrant shall maintain each record for three (3) years after it is made. The record shall include the date of check or inspection, name of inspector, equipment involved, any problems found, and what repair and/or maintenance, if any, was done.

5. Records of alarm system and entrance control checks required by paragraph 1200-2-8-.04(9), if applicable. The licensee or registrant shall maintain each record for three (3) years after it is made.

6. Records of direct reading dosimeters such as pocket dosimeter and/or electronic personal dosimeters readings as required by paragraph 1200-2-8-.05(3). The licensee or registrant shall maintain each record for three (3) years after it is made.

7. Records of dosimetry reports received from the accredited NVLAP personnel dosimeter processor as required by paragraph 1200-2-8-.05(3). The licensee or registrant shall maintain each record until the Division terminates the license or registration.

8. Operating and emergency procedures required by paragraph 1200-2-8-.05(2). The licensee or registrant shall maintain a copy of current operating and emergency procedures until the Division terminates the license or registration. Superceded material shall be retained for three (3) years after the change is made.

9. Evidence of the latest calibration of the radiation survey instruments in use at the site, as required by paragraph 1200–2–8–.04(4). The licensee or registrant shall maintain each record for three (3) years after it is made.

10. Evidence of the latest calibrations of alarm ratemeters and operability checks of pocket dosimeters and/or electronic personal dosimeters as required by paragraph 1200-2-8-.05(3). The licensee or registrant shall maintain each record for three (3) years after it is made.

11. Latest survey records required by paragraph 1200-2-8-.06(4). The licensee or registrant shall maintain the record of each exposure device survey conducted before the device is placed in storage, if that survey is the last one performed in the workday, for three (3) years after it is made.

12. The shipping papers for the transportation of radioactive materials required by Chapter 1200-2-10.

13. When operating under reciprocity pursuant to Rule 1200-2-10-.29, a copy of the Agreement State license authorizing the use of licensed materials; and

14. Records of estimates of exposures because of off-scale personal direct reading dosimeters or of lost or damaged personnel dosimeters until the Division terminates the license or registration.

***Authority:*** *T.C.A. §§4–5–201 et seq. and 68–202–201 et seq.* ***Administrative History:*** *Original rule filed July 18, 2002; effective October 1, 2002. Amendment filed November 17, 2005; effective January 31, 2006. Repeal and new rule filed April 10, 2006; effective June 24, 2006.*

**1200-2-8-.16 SCHEDULE RHS 8-35: RADIOGRAPHER CERTIFICATION.**

(1) Requirements for an independent certifying organization. An independent certifying organization shall:

(a) Be an organization such as a society or association, whose members participate in, or have an interest in, the fields of industrial radiography;

(b) Make its membership available to the general public nationwide that is not restricted because of race, color, religion, sex, age, national origin or disability;

(c) Have a certification program open to nonmembers, as well as members;

(d) Be an incorporated, nationally recognized organization that is involved in setting national standards of practice within its fields of expertise;

(e) Have an adequate staff, a viable system for financing its operations, and a policy-and decision-making review board;

(f) Have a set of written organizational by-laws and policies that provide adequate assurance of lack of conflict of interest and a system for monitoring and enforcing those by-laws and policies;

(g) Have a committee, whose members can carry out their responsibilities impartially, to review and approve the certification guidelines and procedures, and to advise the organization's staff in implementing the certification program;

(h) Have a committee, whose members can carry out their responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;

(i) Have written procedures describing all aspects of its certification program, maintain records of the current status of each individual's certification and the administration of its certification program;

(j) Have procedures to ensure that certified individuals are provided due process with respect to the administration of its certification program, including the process of becoming certified and any sanctions imposed against certified individuals;

(k) Have procedures for proctoring examinations, including qualifications for proctors. These procedures must ensure that the same company or corporation (or a wholly owned subsidiary of such company or corporation) does not employ the individuals proctoring each examination as any of the examinees;

(l) Exchange information about certified individuals with the Division and other independent certifying organizations and/or Agreement States and allow periodic review of its certification program and related records; and

(m) Provide a description to the Division of its procedures for choosing examination sites and for providing an appropriate examination environment.

(2) Requirements for certification programs. All certification programs shall:

(a) Require applicants for certification to:

(Rule 1200-2-8-.16, continued)

1. Receive training in the topics set forth in Rule 1200-2-8-.07; and

2. Satisfactorily complete a written examination covering these topics;

(b) Require applicants for certification to provide documentation that demonstrates that the applicant has:

1. Received training in the topics set forth in Rule 1200-2-8-.07;

2. Satisfactorily completed a minimum period of on-the-job training; and

3. Received verification by an Agreement State or a U.S. NRC licensee that the applicant has demonstrated the capability of independently working as a radiographer;

(c) Include procedures to ensure that all examination questions are protected from disclosure;

(d) Include procedures for denying an application, revoking, suspending and reinstating a certificate;

(e) Provide a certification period of not less than three (3) years or more than five (5) years;

(f) Include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment and annual refresher training in industrial radiography.

(h) Provide a timely response to inquiries, by telephone or letter, from members of the public, about an individual's certification status.

(3) Requirements for written examinations. All examinations shall be:

(a) Designed to test an individual's knowledge and understanding of the topics listed in Rule 1200-2-8-.07;

(b) Written in a multiple-choice format;

(c) Have test items drawn from a question bank containing psychometrically valid questions based on the material in Rule 1200-2-8-.07.

***Authority:*** *T.C.A. §§4-5-201 et seq., 68-202-203, and 68-202-206.* ***Administrative History:*** *Original rule filed July 18, 2002; effective October 1, 2002.*